

LISTGING OF CLAIMS

1. – 5. (Cancelled)

6. (Original) An actuator provided with a strain element having a property of a piezoelectric inverse effect, wherein:

the strain element is wound like a coil;

an electrode having a height lower than a height of the strain element is formed on an inner circumferential surface of the strain element along an end portion of one of an upper end and a lower end; and

an electrode having a height lower than the height of the strain element is formed on an outer circumferential surface of the strain element along an opposite end portion of that of the inner circumferential surface.

7. and 8. (Cancelled)

9. (Original) An actuator provided with a strain element having a property of a piezoelectric inverse effect, wherein:

the strain element is belt-shaped;

an electrode having a width narrower than a width of the strain element is formed on one surface of the strain element along one side portion; and

an electrode having a width narrower than the width of the strain element is formed on the other surface of the strain element along the other side portion.

10. (Original) An actuator provided with a strain element having a property of a piezoelectric inverse effect, wherein:

the actuator includes a belt-shaped metal plate;

a strain element having a width narrower than a width of the metal plate is formed on one surface of the metal plate along one side portion; and

a stain element having a width narrower than the width of the metal plate is formed on the other surface of the metal plate along the other side portion; and

electrodes are formed on surfaces of the strain elements.

11. (Original) An actuator provided with a strain element having a property of a piezoelectric inverse effect, wherein:

the actuator includes a belt-shaped metal plate;

two belt-shaped strain elements each having a width of not larger than half of the metal coil are formed side by side on at least one surface of the metal plate; and

electrodes are formed on surfaces of the strain elements.

12. – 17. (Cancelled)

18. (Original) A method of manufacturing a strain element, comprising the steps of:

forming a coating film of titanium or a titanium compound on a surface of a cylindrical mold;

shaping the coating film, which has been formed on the surface of the cylindrical mold, like a coil;

forming a crystal film of a strain element having a property of a piezoelectric inverse effect by hydrothermal synthesis on the coating film shaped like the coil; and

removing the strain element from the cylindrical mold.

19. (Original) A method of manufacturing a strain element according to claim 18, further comprising a step of forming a crystal film of a strain element having the property of the piezoelectric inverse effect by the hydrothermal synthesis on an inner circumferential surface of the strain element removed from the cylindrical mold.

20. (Currently Amended) A method of manufacturing a strain element according to claim 18 [[or 19]], further comprising:

a step of forming a coating film of titanium or a titanium compound on an outer circumferential surface of the strain element removed from the cylindrical mold; and

forming a crystal film of a strain element having the property of the piezoelectric inverse effect by the hydrothermal synthesis on the coating film formed on the outer circumferential surface of the strain element.

21. (Original) A method of manufacturing a strain element, comprising the steps of:

forming a hydrophilic region into a coil shape on a surface of a cylindrical mold made of a water-repellent resin as a base material;

dipping the cylindrical mold in a solution containing suspended fine particles of a strain element having a property of a piezoelectric inverse effect;

pulling up the cylindrical mold; and

removing the adherent strain element from the cylindrical mold.

22. (Original) A method of manufacturing a strain element, comprising the steps of:

performing a water-repellent treatment so that a hydrophilic region is formed into a coil shape on a surface of a cylindrical mold made of a hydrophilic resin as a base material;

dipping the cylindrical mold in a solution containing suspended fine particles of a strain element having a property of a piezoelectric inverse effect;

pulling up the cylindrical mold; and

removing the adherent strain element from the cylindrical mold.

23. (Currently Amended) A method of manufacturing a strain element according to claim 21 [[or 22]], further comprising a step of performing a hot isostatic press to the cylindrical mold before the adherent strain element is removed from the cylindrical mold.

24. (Currently Amended) A method of manufacturing a strain element according to [[any one of claims]] claim 21 [[to 23]], further comprising the steps of:

forming an electrode on at least one of an obverse surface and a reverse surface of the strain element removed from the cylindrical mold;

dipping the strain element again the solution containing the suspended fine particles of the strain element having the piezoelectric inverse effect; and pulling up the strain element.

25. (Original) A method of manufacturing a strain element, comprising the steps of:

laminating fine particles of a strain element having a piezoelectric inverse effect in a vessel; and

irradiating laser light simultaneously with the laminating step to melt and sinter the fine particles of the strain element.

26. (New) A method of manufacturing a strain element according to claim 19, further comprising:

a step of forming a coating film of titanium or a titanium compound on an outer circumferential surface of the strain element removed from the cylindrical mold; and

forming a crystal film of a strain element having the property of the piezoelectric inverse effect by the hydrothermal synthesis on the coating film formed on the outer circumferential surface of the strain element.

27. (New) A method of manufacturing a strain element according to claim 22, further comprising a step of performing a hot isostatic press to the cylindrical mold before the adherent strain element is removed from the cylindrical mold.

28. (New) A method of manufacturing a strain element according to claim 22, further comprising the steps of:

forming an electrode on at least one of an obverse surface and a reverse surface of the strain element removed from the cylindrical mold;

dipping the strain element again the solution containing the suspended fine particles of the strain element having the piezoelectric inverse effect; and pulling up the strain element.

29. (New) A method of manufacturing a strain element according to claim 23, further comprising the steps of:

forming an electrode on at least one of an obverse surface and a reverse surface of the strain element removed from the cylindrical mold;

dipping the strain element again the solution containing the suspended fine particles of the strain element having the piezoelectric inverse effect; and pulling up the strain element.

30. (New)A method of manufacturing a strain element according to claim 27, further comprising the steps of:

forming an electrode on at least one of an obverse surface and a reverse surface of the strain element removed from the cylindrical mold;

dipping the strain element again the solution containing the suspended fine particles of the strain element having the piezoelectric inverse effect; and pulling up the strain element.